SCARLET TECH

WL-410/XB Wireless Wind Alarm System

User Guide

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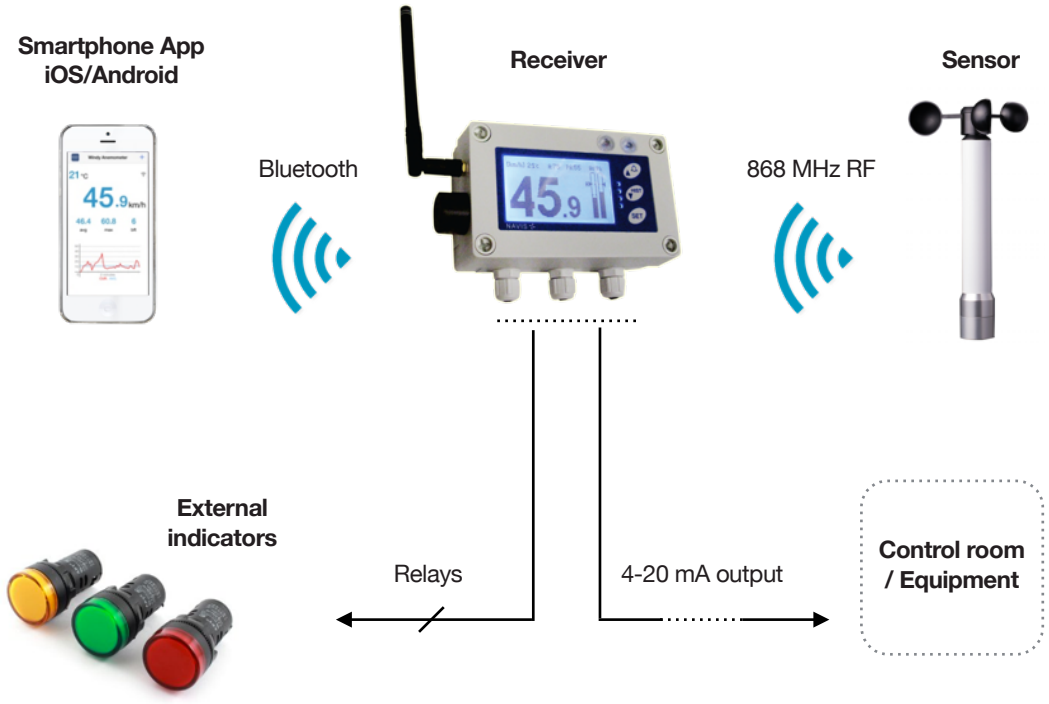
Instrument at a Glance

Overview

WL-410/XB Wireless Wind Alarm System consists of a wind speed sensor and a receiver. The sensor measures wind speed and transmit data to the receiver. The 3.5-inch LCD display of receiver shows readings on the main page and the history graphs are shown in different pages. According to the preset values, the receiver can trigger local alarms such as LED lights and buzzer, or trigger external indication via 3 built-in relays when measured wind speeds exceeding the thresholds.

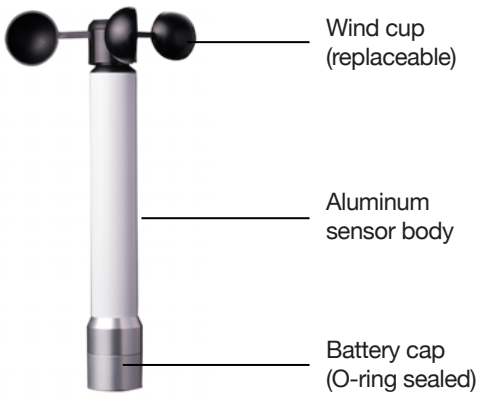
A 868 MHz radio frequency module is installed in the receiver of model WL-410 and WL-410XB. In mode WL-410XB, an additional Bluetooth Low Energy chip is installed in the receiver to enable smartphone communication functionality. WL-410XB sensor output power is stronger (+14 dBm) than WL-410, allowing a longer transmission distance.

An optional 4-20 mA current loop module is available to both WL-410 and WL-410XB to make long distance cable transmission possible.



Sensor & Receiver

Sensor



Sensor unit switches ON automatically when the anemometer cups revolve. It switches OFF 6 hours after the anemometer cups stop revolving. In ON state, the sensor updates wind speed data every two seconds.

Address

The correspondent sensor address has been preset at the factory. Always set the address correspond to the address of the sensor from which the receiver will receive data. Address of the sensor is indicated on the sensor label and in the interior of sensor battery compartment.

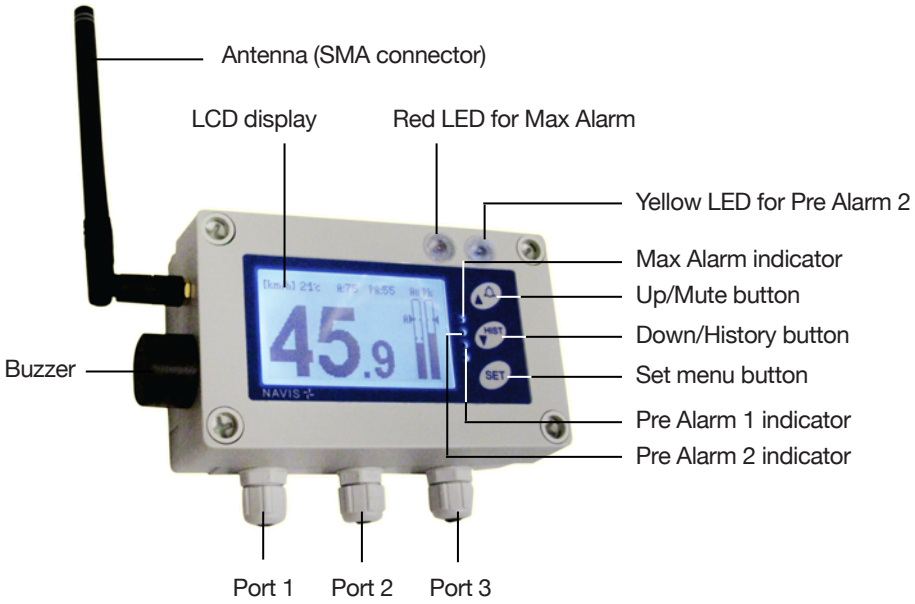
Range

Connection between sensor and receiver goes through free 868 MHz band (optionally 908MHz). Transmission range is up to 500 meters (1300 meters at models XB) - at 10 m sensor mounting height and when there is no obstacle between the sensor and the display unit. Inside buildings the range is much shorter. Normally the signal can be received through two to three walls.

Power

When the "Lo battery" appears on the display, replace the sensor battery. Take off the battery cover (on the bottom) by turning it anti clockwise. Pull out the battery holder and insert new battery (Lithium 3.6 V AA).

Receiver



Signals from sensor

The indication light on the top of the LCD display blinks when the receiver receives signals from the sensor (every 2 seconds if reception is good). Signal strength is numerically shown in dB.

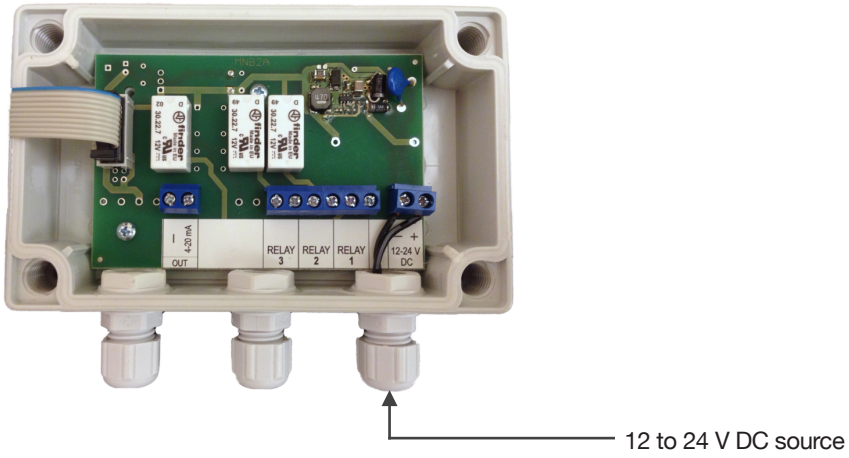
When the sensor stop sending data (in OFF state) or the signal is lost for a more than 30 seconds, the **"No data"** appears on the display, indicating that the receiver doesn't receive data from the sensor (sensor OFF or out of range).

On-device alarms

The threshold wind speed of Pre Alarm 1, Pre Alarm 2 and Max Alarm can be configured via setting menus. Please see the section "Settings" for more details.

- Pre Alarm 1 triggers one LED indicator sit beside the LCD screen.
- Pre Alarm 2 triggers two LED indicators sit beside the LCD screen and the yellow LED on the top of LCD display. It sounds the buzzer interleaved.
- Max Alarm triggers all three LED indicators sit beside the LCD screen and the red LED on the top of LCD display. It sounds the buzzer continuously.

DC Power

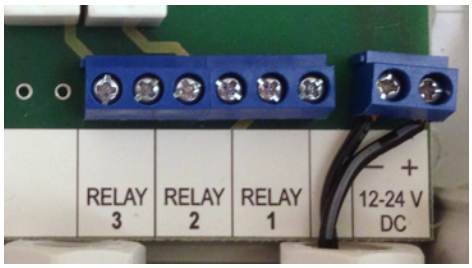


Working voltage of receiver is 12 to 24 V DC. Please plug the DC power source to the corresponding jack on the circuit board after opening the front panel.

> ***NOTE***: Please make sure the polarity is correct otherwise the receiver will be damaged.

Relays & external indicators

The relay jacks are by the side of DC power.



Relay 3 When wind speed exceeds the value set on pre alarm 1, the relay 3 will activate. Please see section "Settings" for more details.

Relay 2 When wind speed exceeds the value value set on pre alarm 2, the relay 2 will activate and yellow light will start blinking and buzzer will sound with interruptions. When sound alarm is activated you can mute it by pressing upper key for 3 seconds. Please see section "Settings" for more details.

Relay 1 When set value is exceed the relay 1 will activate, red light will flash and buzzer will continuously sound. When sound alarm is activated you can mute it by pressing upper key for 3 seconds. Please see section "Settings" for more details.

Bluetooth (WL-410XB only)

Wind speed / air temperature data are transmitted over Bluetooth every second. With free app “Wind Smart” you can read data of current, average and maximum wind speed, temperature or view history graphs on your smartphone.

In smartphone Application setting menu always set the address correspond to the address of the WL-410/XB sensor. The range is up to 40 meters from WL-410/XB display unit. Inside the building the range is much smaller. Range also varies with type of smartphone or tablet.

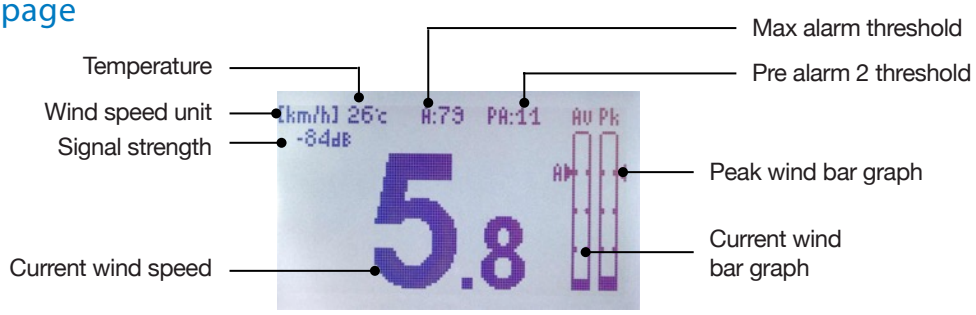
Android: Applications requires device with Android 4.3 or newer with Bluetooth Low Energy (BLE).
Apple: In iPad/iPhone settings for application Wind Smart configure parameter "Allow Location Access" to "While Using the App".

Display

WL-410/XB display consists of 3 pages including: 1) readings of wind speed; 2) alarm settings and 3) graphs to provide user information for project management.

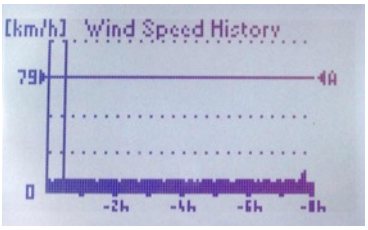
By pressing HIST key user can navigate to page 2 and 3 to see the wind speed and max. alarm history. To switch back to the first page user can long pressing HIST key for 3 seconds or leave the device alone for 1 minutes.

First page



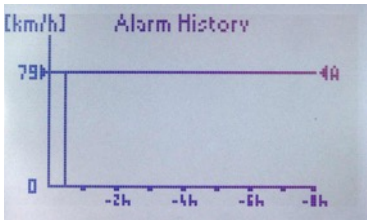
The contents of display are shown above. *Note*: in both bar graphs, the max alarm value set by user is always on the 3/4 bar height. One icon not shown in the photo is data packet receiving indicator and it flashes by the side the signal strength.

Second page



8 hours peak wind speed history graph with 5 minutes resolution, each row presents the peak wind speed during 5 minutes

Third page



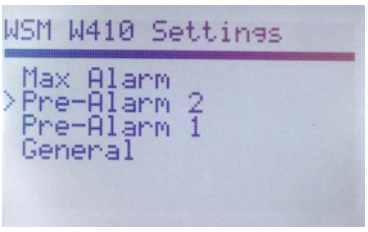
8 hours Maximum alarm history graph with 5 minutes resolution.

Restore receiver to default

With upper button pressed at power ON – RESET is performed (all settings except "Sensor Address"and "WS Cal. Factor" goes to default values).

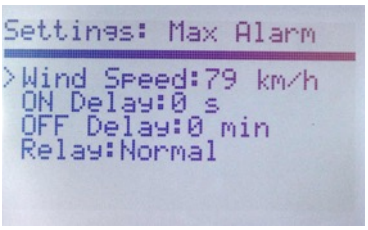
Settings

Setting of parameters



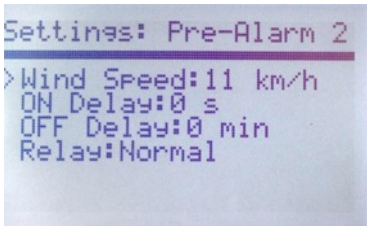
1. Hold pressed SET key to enter the setting menu. If the password protection is active, enter correct password. The options of settings are shown on display.
2. Select the option by using up and down keys and press SET key to enter into selected option.
3. By up and down keys select the parameter you wish to adjust and press SET key to enter into selected parameter. The adjustable parameter blinks.
4. By up and down key adjust the parameter value. Press SET to enter new value and move to next parameter.
5. Exiting setting menu: hold pressed SET key to move back for one level. Anemometer also return to normal operation after 2 minutes of inactivity.

Max alarm



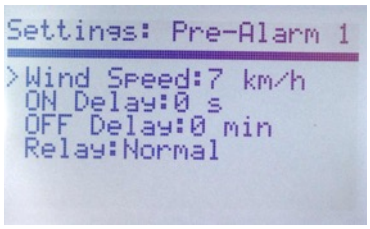
	Factory default	Settable range	Description
Wind speed	72 km/h	1…50 m/s	Max alarm limit
On delay	0 sec	0…600 sec	Minimum time of exceed wind speed to activate the max alarm
Off delay	0 min	0…60 min	Delay of alarm switch OFF after wind speed drop below preset level
Relay	Normal	Normal/interleaved	Inverted operation of relay

Pre alarm 2



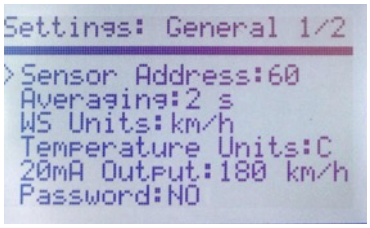
	Factory default	Settable range	Description
Wind speed	52 km/h	1…50 m/s	Pre alarm 2 limit
On delay	0 sec	0…600 sec	Minimum time of exceed wind speed to activate the pre alarm 2
Off delay	0 min	0…60 min	Delay of alarm switch OFF after wind speed drop below preset level
Relay	Normal	Normal/interleaved	Inverted operation of relay

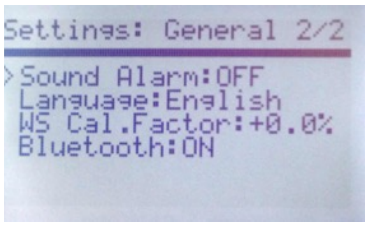
Pre alarm 1



	Factory default	Settable range	Description
Wind speed	42 km/h	1…50 m/s	Pre alarm 1 limit
On delay	0 sec	0…600 sec	Minimum time of exceed wind speed to activate the pre alarm 1
Off delay	0 min	0…60 min	Delay of alarm switch OFF after wind speed drop below preset level
Relay	Normal	Normal/interleaved	Inverted operation of relay

General settings





	Factory default	Settable range	Description
Sensor address	Enclosed sensor	1…255	Set the sensor address of your Wind speed sensor
Averaging period	2 sec	2/10/30 sec	Averaging period for showed wind speed
Wind speed unit	km/h	m/s, km/h, mph, knots	Unit of displaying wind speed
Temperature unit	° C	° C or ° F	Unit of displaying Temperature
20 mA output	180 km/h	10…50 m/s	Wind speed at 20 mA output 4mA = 0 km/h 20 mA = seted value wind speed * applicable only at model with additional 4-20 mA output
Password	No	No Yes:0000…9999	Activation of password protection and setting of password
Sound alarm	On	On/Off	Switching sound alarm ON and OFF
Language	English	English/French	Language selection
Wind speed calibration factor	+0.0%		Calibration factor for wind speed (-15,0 ...+15,0% in 0,5% steps)
Bluetooth	On	On/Off	Power ON/OFF Bluetooth transmitter * applicable only at WSM W410XB model

Technical Specification

Instrument

	WL-410	WL-410/ 4-20mA	WL-410XB	WL-410XB/ 4-20mA
Sensor & receiver				
Measurement range	0.6...50.0 m/s			
Unit	m/s, km/h, knots, mph			
Resolution	0.1 m/s			
Accuracy	+/-3%			
Averaging period	Selectable 2 s, 10 s, 30 s			
Operating voltage	12...24 V DC			
Power consumption	300 mA (max.)			
Transmission distance	300 m		1300 m	
Distance with YAGI antenna	1.5...2.4 km		6.5...10.0 km	
Relay contact rating	1 A/12 V DC; 1 A/24 V DC			
Temperature operating range	-25...60° C			
Sensor battery	3.6 V AA Lithium batteries			
Sensor battery life	5 years		3 years	
Audible alarm	85...90 dB			
Antenna input (receiver)	50 ohm, SMA connector			
Output				
Relay	3 x relays, 2 A / 24 V			
Output	-	4...20 mA 4 mA=0 m/s 20 mA=10...50 m/s (programmable)	-	4...20 mA 4 mA=0 m/s 20 mA=10...50 m/s (programmable)
Mechanical				
Bearings	2 x precision stainless steel ball bearing			
Sensor housing	AL/PVC			
Sensor cups (replaceable)	PA (Nylon)			
Receiver housing	ABS, IP65			
Sensor dimension	Height 210 mm, cup-to-cup diameter 120 mm			
Receiver dimension	150 x 80 x 55 mm			
Mounting	Mounts on a pipe with ø20 mm outside diameter			
Bluetooth LE	-		Yes. Range is up to 30 m.	

Safety, Handling, & Maintenance

Important safety information

WARNING: Failure to follow these safety instructions could result in fire, electric shock, or other injuries, or damage to sound level meter or other property. Read all the safety information below before using sound level meter.

Operate Avoid using instrument in humid or wet places. Make sure that humidity is within the limits indicated in the next section. Avoid using meter in presence of explosive gas, combustible gas, steam or excessive dust.. Be sure to turn it off after use. If you expect not to use the instrument for a long period remove batteries to avoid leakages of battery liquid which could damage the its inner components.

Handling Handle the meter with care. It is made of sensitive electronic components. The meter can be damaged if dropped, burned, punctured, or crushed, or if it comes in contact with liquid. Don't use a damaged meter, such as one with a cracked screen, as it may cause injury.

Important handling information

Cleaning Clean instrument immediately if it comes in contact with anything that may cause stains—such as dirt, ink, makeup, or lotions. To clean:

- Disconnect all cables and turn instrument off.
- Use a soft, lint-free cloth.
- Avoid getting moisture in openings.
- Don't use cleaning products or compressed air.

Operating temperature The instrument is designed to work in ambient temperatures between 5° and 40° C (41° and 104° F) and stored in temperatures between -10° and 60° C (14° and 140° F). The instrument can be damaged and battery life shortened if stored or operated outside of these temperature ranges. Avoid exposing the instrument to direct sunlight even the the air temperature is within the limits.

Operating humidity The instrument is designed to work in humidity < 80%*rh* and stored in dry place where humidity is less than 70%*rh*.

Store microphone carefully Microphone is the key component of the instrument and keep it dry and avoid severe shake or vibration.

Battery replacement Low battery icon displayed in LCD indicates the user needs to replace batteries on sensor. To replace:

- Unscrew the O-ring sealed battery cap anti-clockwise.
- Pull out the battery holder, remove old battery and insert new one.
- Insert the battery cap back and screw the O-ring sealed battery cap.

NOTE: Please make sure screw the O-ring sealed cap correctly to have the best dust and water proof capability.

Packing list

- Wind speed sensor x 1
- Receiver unit x 1
- SMA antenna x 1
- User guide x 1
- Bluetooth & 4-20 mA current loop modules are optional in WL-410XB

Accessories & spare parts

To help in mounting and to enhance the transmission distance, you may need the following accessories. Please contact your local representative to get the quotation.

Accessories

- Magnetic mounting assembly (receiver)
- YAGI antenna with 3 m cable
- Outdoor antenna with 3 m cable
- Self-leveling mounting assembly (sensor)
- Magnetic mounting assembly (sensor)

Spare parts

Wind cup is replaceable and can be order separately.

Standard

EMC This instrument was designed in accordance with EMC Standards in force and its compatibility has been tested in accordance with EN61326-2 (2006).

Warranty & Services

Warranty conditions

This instrument is guaranteed for one year against material or production defects, in accordance with our general sales conditions. During the warranty period the manufacturer reserves the right to decide either to repair or replace the product.

Should you need for any reason to return back the instrument for repair or replacement take prior agreements with the local distributor from whom you bought it. Do not forget to enclose a report describing the reasons for returning (detected fault). Use only original packaging. Any damage occurred in transit due to non-original packaging will be charged anyhow to the customer.

The warranty doesn't apply to:
Accessories and batteries (not covered by warranty)
Repairs made necessary by improper use (including adaptation to particular applications not foreseen in the instructions manual) or improper combination with incompatible accessories or equipment.
Repairs made necessary by improper shipping material causing damages in transit.
Repairs made necessary by previous attempts for repair carried out by non-skilled or unauthorized personnel.
Instruments for whatever reason modified by the customer himself without explicit authorization of our Technical Dept.

The contents of this manual may not be reproduced in any form whatsoever without the manufacturer's authorization.

Our products are patented. The logotypes are registered. We reserve the right to modify characteristics and prices as part of technological developments which might require them.

Services

Shouldn't the instrument work properly, before contacting your distributor make sure that batteries are correctly installed and working, check the test leads and replace them if necessary.

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